AMENDMENT TO THE SPECIFICATION

Please replace the paragraph found on page 8, line 28 through page 9, line 23, with the following replacement paragraph:

Combustible electrochemical sensors as described herein exhibit relatively high and reproducible sensitivity to carbon monoxide in a relatively wide range of carbon monoxide concentrations. This behavior is illustrated in Figures 3 and 4 which provide charts of combustible sensor response to varying levels of carbon monoxide. Fig. 5 illustrates an added benefit of an embodiment of the present invention. Specifically, electrochemical combustible sensors in accordance with embodiments of the present invention exhibit desirable sensitivity at lower carbon monoxide concentrations, particularly in the range of 5-50 parts per million. Adjusting the specific area of the working electrode provides the sensor with a high sensitivity to different carbon monoxide ranges, as desired. The sensor materials, e.g. zirconia and gold, are also known to be stable in high sulfur environments. The tests of manganite process electrode indicate that any change in the structure after exposure ~~after~~ <u>to</u> sulfur dioxide at 1,000°C for two weeks (Fig. 6) is both stable and reproducible in response to carbon monoxide in high sulfur environments, as opposed to platinum-containing combustible sensors.

Please replace the paragraph found on page 11, line 28 through page 13, line 10, with the following replacement paragraph:

Fig. 7 is a diagrammatic view of a RTD-type combustible sensor in accordance with embodiments of the present invention.

Sensor 30 includes holder 32 having catalyst 34 and reference 36 RTD elements. RTD elements 34 and 36 are thermally insulated from holder 32 by cement, Teflon, or a suitable high temperature epoxy as indicated at reference numeral 38. Holder 32 may be constructed from any suitable material that is able to support RTDs 34 and 36, but is preferably metal or a ceramic that is stable in the sensor application conditions. RTD elements 34 and 36 may be used in either the film or wire form, or any other suitable form and are preferably sealed in a protective cover 41, 43 that is preferably constructed of stainless steel. Thermal contact between RTD elements 34 and 36 and the RTD cover may be facilitated by using a thermoconductive material, such as a thermoconductive powder, cement, or epoxy as indicated at reference numeral 40. RTD elements 34 and 36 are sealed at a leading end with cement, or high temperature epoxy as indicated at reference numeral 42. The electrical leads coupling to RTDs 34 and 36 allow the variable physical signal corresponding to the temperature change of the device to be measured. A thin film of catalyst 44 is applied to the cover of catalyst RTD 34, while the cover of reference RTD 36 remains uncovered or protected by a ceramic film. Preferred catalysts include Group VIII noble metal catalysts, such as platinum, palladium, and rhodium and mixtures as well as metal oxide combustion catalysts. Other suitable catalysts include perovskite or hopcalite. Catalytic film 44 can also be made from solution, paste or powder and applied using thick or thin film techniques. The layer of the catalytic element is preferably relatively thin in order to promote conduction of the combustion heat to RTD element 34. The two RTD elements 34 and 36 are preferably placed in similar flow regions in the measured gas and have relatively close thermal mass, surface area and aerodynamic shape.

Please replace the paragraph found on page 15, line 18 through page 16, line 6, with the following replacement paragraph:

In the past, sulfur tolerant composite electrodes based on oxides selected from the group of zirconium, yttrium, scandium, thorium, rare earth metals, and mixtures thereof were proposed. However, it is believed that more reliable mixed-conducting materials could be developed based on fluorite-type oxide ion conducting solid electrolytes, i.e. based on ceria, having considerably higher ionic and electronic conductivity. It is believed that electrodes based on these materials will be much more effective at having lower polarization resistivity. However, in the prior art, mixed conducting materials based on fluorite-type oxide ions have heretofore not been disclosed as being usable in sensors and particularly not in high sulfur resistive oxygen sensors, nor has information about the mixed conducting electrode and film properties with respect to such sensor ~~has~~ been provided.

Please replace the paragraph found on page 17, lines 12 through 19, with the following replacement paragraph:

Fig. 18 is an atomic force microscope (AFM) topographical image of a $Ce_{0.80}Tb_{0.2}O_{1.90+\delta}$ film sample sintered at approximately 1,300°C illustrating relatively small particles of uniform size, approximately 0.3-1 micrometer (μm) and very dense microstructure. As expected, these particles are considerably larger than those of the "as prepared" powder by the known hydrothermal method (approximately 20-50 nm).